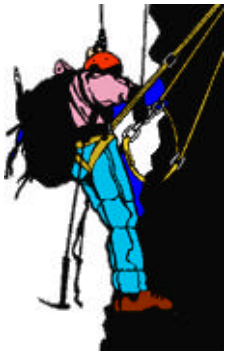
WHAT'S HOT AND WHAT'S NOT!

WHAT IS CLIMATE?
Objective: 3240-0502

If you have ever planned a trip with your parents, the climate of your destination was probably a big part of your plans. People travel to Florida for the sunny, moist weather, Colorado for the snowy mountains, and Arizona for the hot, dry weather. The climate of your area affects you every day. Weather determines what you will wear, where you will go, or if you should just stay inside! It sounds like weather and climate are interchangeable, but they are actually different. You check the weather every day, looking at the predicted temperature and precipitation. If you were to keep a log of the weather conditions over a long period of time, you would start to notice patterns.

These patterns, or the average weather conditions over a long period of time, for a region, is the **climate** of that region. Climate is determined by two main factors: temperature and precipitation. Using just temperature or just precipitation would be misleading. For example, San Francisco and St. Louis both have an average yearly temperature of about 13 degrees Celsius. At first, it seems as though they have the same climate. Missouri, however, has cold winters and hot summers while San Francisco has a mild climate all year long.

MEASURING CLIMATE
To get an accurate measurement of the climate of a region, several factors that influence temperature and precipitation must be accounted for: elevation, latitude, prevailing wind direction, topography, and ocean currents.

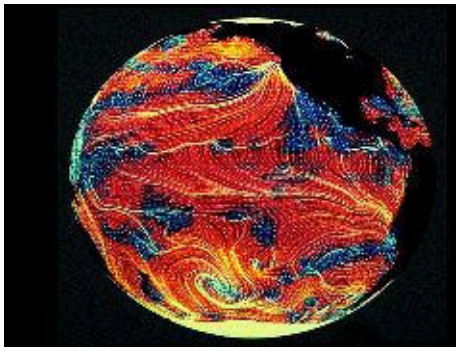


ELEVATION
Elevation is the distance above sea level. As you go higher up a mountain, the air pressure decreases and the gas molecules spread farther and farther apart. Less dense air holds less heat than dense air, so the farther above sea level you are, the lower the temperature will be.

LATITUDE

Latitude measures how far you are north or south of the equator. Latitude determines the amount of solar energy received by that region. Regions close to the equator receive direct rays of the sun and therefore receive more radiant energy and are warmer. At the areas closer to the poles, the suns rays are at an angle so these areas receive less radiant energy and are cooler.

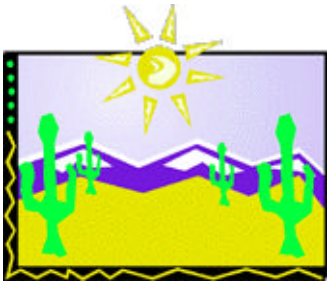
OCEAN CURRENTS



Water in the ocean travels in paths called currents. Currents can either be warm or cold. The temperature of the water affects the temperature of the air above it. If the water is cold, it cools the air above it. If it is warm, it heats up the air above it. Ocean currents traveling away from the equator are warm, warming the air which moves onto the land near these areas. Currents flowing toward the equator are colder, so the air masses, moving over these currents, are cooled. These cooled air masses then flow over the regions in their path.

TOPOGRAPHY

The topography, or features of the land also influences the climate. The amount of precipitation in a region is affected by mountain ranges in that area. Mountains cause air to rise. Rising air becomes less dense allowing the condensation of water. Precipitaion occurs. Air moving down the other side of the mountain becomes more dense. Sinking air does not produce precipitation. The leeward side, or side facing away from the wind, receives much less precipitation.



PREVAILING WINDS

Prevailing winds are the winds which blow more often from one direction than another. Winds can greatly affect the amount of precipitation an area receives depending on the amount of moisture they are carrying. These prevailing winds can move air masses from the ocean onto a continent bringing moisture onto the continent. Or prevailing winds may move air masses from continent to the ocean, moving drier air from the continent. Prevailing winds affect the climate of an area.

LOCAL OR DAILY WINDS

The direction of local winds is determined by the daily temperature variations.

When the air over the land is warmer than the air over a body the wind blows from the water to the land and is called a sea breeze. This often occurs in the morning and can be called a morning breeze When the air over the land is cooler than the air over the water, the wind will blow from the land to the water and is called a land breeze. This usually occurs in the evening or an evening breeze.

Local winds will also occur because of mountains. If the air over the mountain is warmer than the valley, the wind will blow from the mountain to the valley. This wind is called a valley breeze. In the evening when the mountain cools off faster than the valley, the wind blows from the mountain to the valley and is called a mountain breeze. On a hot summer evening, mountain breezes can be a cool welcome.

Visit the Weather Station for more information and to take a weather and climate quiz.

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